

WHAT IS CLAIMED IS:

1. A vehicle headrest apparatus comprising:

a headrest unit including left and right headrest members dividing the headrest unit approximately midway in a transverse direction and a mounting member configured to
5 swingably couple the left and right headrest members to an upper end part of a seatback by the mounting member, the left and right headrest members being configured to support a seated passenger;

a head restraining member operatively coupled to the left and right headrest members to move upward and toward a front of a vehicle in a deployment direction;

10 a swing/pushup force applying device configured and arranged to apply an urging force to swing the left and right headrest members upward and toward the front of the vehicle in the deployment direction of the head restraining member;

an auxiliary force adding device configured and arranged to apply an auxiliary urging force to the left and right headrest members in the deployment direction of the head
15 restraining member;

a lock device operatively coupled to the left and right headrest members to hold the left and right headrest members in an initial storage position against the urging force applied by the swing/pushup force applying device and the auxiliary urging force applied by the auxiliary force adding device; and

20 a controller operatively coupled to the lock device to release the lock device upon detecting a rear-end collision.

2. The vehicle headrest apparatus as recited in claim 1, wherein

the auxiliary force adding device includes an expandable body installed in a front
25 to rear compressed condition between the left and right headrest members and a holding plate that is fixedly coupled relative to the mounting member such that the holding plate is positioned rearward of the left and right headrest members.

3. The vehicle headrest apparatus as recited in claim 2, wherein

30 the expandable body is a soft foam body made of urethane.

4. The vehicle headrest apparatus as recited in claim 2, wherein
the expandable body is configured to support the head restraining member from the
rear with a large surface that is substantially uniform across a rear section of the head
restraining member when the left and right headrest members are in a fully swung forward
5 state.

5. The vehicle headrest apparatus as recited in claim 2, wherein
the expandable body includes a forward facing surface and a pair of rearward
slanted surfaces extending from lateral sides of the forward facing surface, the lateral sides
10 of the forward facing surface generally facing the left and right headrest members such
that the soft foam body has a wedge shape in a top plan view.

6. The vehicle headrest apparatus as recited in claim 1, wherein
the auxiliary force adding device is an elastic member spanning between left and
15 right bodies that are configured to swingably support the left and right headrest members
on the mounting member, the elastic member being in a tensile state and configured to add
a rotational force against the left and right bodies in the deployment direction of the left
and right headrest members.

20 7. The vehicle headrest apparatus as recited in claim 6, wherein
the elastic member is tensile coil spring.

8. The vehicle headrest apparatus as recited in claim 6, wherein
the elastic member is an elongated piece of rubber.
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9. The vehicle headrest apparatus as recited in claim 6, wherein
the head restraining member includes a flexible member coupled to the left and
right headrest members such that the flexible member moves upward and toward the front
of the vehicle from an non-tensioned state to a tensioned state when the left and right
30 headrest members are in a fully swung forward state.

10. The vehicle headrest apparatus as recited in claim 3, wherein
the soft foam body is configured to support the head restraining member from the
rear with a large surface that is substantially uniform across a rear section of the head
restraining member when the left and right headrest members are in a fully swung forward
5 state.

11. The vehicle headrest apparatus as recited in claim 3, wherein
the soft foam body includes a forward facing surface and a pair of rearward slanted
surfaces extending from lateral sides of the forward facing surface, the lateral sides of the
10 forward facing surface generally facing the left and right headrest members such that the
soft foam body has a wedge shape in a top plan view.

12. The vehicle headrest apparatus as recited in claim 4, wherein
the expandable body includes a forward facing surface and a pair of rearward
15 slanted surfaces extending from lateral sides of the forward facing surface, the lateral sides
of the forward facing surface generally facing the left and right headrest members such
that the soft foam body has a wedge shape in a top plan view.

13. The vehicle headrest apparatus as recited in claim 1, wherein
20 the head restraining member includes a flexible member coupled to the left and
right headrest members such that the flexible member moves upward and toward the front
of the vehicle from an non-tensioned state to a tensioned state when the left and right
headrest members are in a fully swung forward state.

25 14. The vehicle headrest apparatus as recited in claim 13, wherein
the head restraining member further includes a cover member coupled to the left
and right headrest members such that cover member moves upward and toward the front
of the vehicle with the flexible member supporting a rear section of the cover when the
left and right headrest members are in a fully swung forward state to tension the flexible
30 member.

15. The vehicle headrest apparatus as recited in claim 1, wherein the auxiliary force adding device is configured and arranged to apply the auxiliary urging force to inner free end parts of the left and right headrest members.

5 16. The vehicle headrest apparatus as recited in claim 15, wherein the head restraining member includes a flexible member coupled to the left and right headrest members such that the flexible member moves upward and toward the front of the vehicle from a non-tensioned state to a tensioned state when the left and right headrest members are in a fully swung forward state.

10 17. The vehicle headrest apparatus as recited in claim 16, wherein the head restraining member further includes a cover member coupled to the left and right headrest members such that cover member moves upward and toward the front of the vehicle with the flexible member supporting a rear section of the cover when the
15 left and right headrest members are in a fully swung forward state to tension the flexible member.

18. The vehicle headrest apparatus as recited in claim 16, wherein the auxiliary force adding device includes an expandable body installed in a front
20 to rear compressed condition between the left and right headrest members and a holding plate that is fixedly coupled relative to the mounting member such that the holding plate is positioned rearward of the left and right headrest members.

25 19. The vehicle headrest apparatus as recited in claim 18, wherein the expandable body is configured to support the head restraining member from the rear with a large surface that is substantially uniform across a rear section of the head restraining member when the left and right headrest members are in a fully swung forward state.

30 20. A vehicle headrest apparatus comprising:
headrest support means for mounting to an upper end part of a seatback and for supporting a seated passenger's head;

headrest deployment means swingably coupled to the headrest support means between initial storage positions and fully swung forward states;

5 head restraining means for supporting the passenger's head when a rear end collision occurs, the head restraining means being coupled between the headrest deployment means;

swing/pushup force applying means for applying an urging force to the headrest deployment means to move the head restraining means upward and toward a front of a vehicle in a deployment direction of the head restraining means;

10 auxiliary force adding device means for applying an auxiliary urging force to the headrest deployment means in the deployment direction of the head restraining means;

lock means for holding the headrest deployment means in the initial storage positions against the urging force applied by the swing/pushup force applying means and the auxiliary urging force applied by the auxiliary force adding means; and

control means for releasing the lock device upon detecting a rear-end collision.

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